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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,160	04/08/2004	Shinsuke Takeguchi	43888-296	7038

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MCDERMOTT, WILL & EMERY
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WASHINGTON, DC 20005-3096

EXAMINER

ONEILL, KARIE AMBER

ART UNIT	PAPER NUMBER
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1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/820,160	Applicant(s) TAKEGUCHI ET AL.	
	Examiner Karie O'Neill	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 10-18 is/are pending in the application.
- 4a) Of the above claim(s) 10-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The Applicant's amendment filed on June 16, 2009, was received. Claim 1 has been amended. Claims 7-9 have been cancelled. Claims 10-18 have been withdrawn from consideration as being drawn to a non-elected invention. Therefore, Claims 1-6 are pending in this office action.

Claim Rejections - 35 USC § 103

2. The rejection of Claims 1, 3-6 and 8-9 under 35 U.S.C. 103(a) as being unpatentable over Yoshimoto et al. (US 2003/0104265 A1) in view of Kumata et al. (US 4,508,793) have been overcome based on the amendments to the claim and the arguments presented on pages 5-7 of the Remarks dated June 16, 2009.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimoto et al. (US 2003/0104265 A1) in view of Misawa et al. (US 5,158,837).

With regard to Claim 1, Yoshimoto et al. discloses in Figures 1-2 and 5, a polymer electrolyte fuel cell (5, D) comprising a cell stack (2, E) including a hydrogen ion conductive polymer electrolyte membrane (A), a pair of electrodes (B,C) sandwiching said membrane and a pair of conductive separators (H), one of which has

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a gas flow channel for supplying and exhausting a fuel gas to and from one of said electrodes and the other has a gas flow channel for supplying and exhausting an oxidant gas to and from the other electrode (paragraphs 0003-0004 and 0021-0022).

Yoshimoto et al. discloses in Figures 1 and 2, wherein at least one of said gas flow channels (1a) is connected to an inlet manifold (6) at a junction, wherein the lowermost part of said junction is positioned above a gas supply pipe (6a) connected to said inlet manifold (6) (paragraph 0023). Yoshimoto et al. does not disclose wherein the gas supply pipe (6a) is extended into said inlet manifold beyond an endplate located at a nearest end of said cell stack in the laminating direction, and an extended part of said gas supply pipe has a plurality of holes in the top thereof, which are spaced apart at decreasing intervals inwardly.

Misawa et al. discloses a solid oxide fuel cell including an oxidizing gas feed pipe (1) having a plurality of circular holes (2) successively provided in the lateral face of the oxidizing gas feed pipe (1) in the longitudinal direction, each of the circular holes (2) functions as an oxidizing gas feeding portion, so that fresh oxidizing gas is fed through each of these circular holes (2). The gradient of the concentration of oxygen is regulated by adjusting the diameter of the circular holes which are gradually increased from the vicinity of the opening of the fuel cell to the bottom (column 6, lines 8-21).

Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to space apart the plurality of holes on the Yoshimoto et al. supply pipe at decreasing intervals inwardly, just as Misawa et al. spaces the plurality of holes with increasing diameter, because Misawa teaches that the reaction on the electrode is

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made uniform, the temperature is made uniform and the thermal strain and stress can be reduced as a whole, and the electric power generating efficiency can be totally enhanced (column 5, lines 34-38). It is also known in the art that having large holes spaced apart at decreasing intervals inwardly will allow for the same amount of gas supply to pass through the pipe as when an increased number of smaller diameter holes are placed close together in the same space.

With regard to Claim 3, Yoshimoto et al. discloses in Figure 2, wherein said inlet manifold (6) has a vertically oriented cross-section.

With regard to Claim 4, Yoshimoto et al. discloses in Figure 2, wherein a junction of gas supply pipe (6a) with said inlet manifold (6) is positioned below the center of the inlet manifold (6). This can be seen in Figure 2 where the supply pipe (6a) is located at the bottom portion of the manifold (6) and the flow channels (1a) are located at the top portion of the manifold (6).

With regard to Claim 5, Yoshimoto et al. discloses in Figure 6, wherein said at least one of said gas flow channel is connected to an outlet manifold (K), which has a gas exhaust pipe connection (L), and wherein the junctions of said gas flow channel and said gas exhaust pipe (L) with said outlet manifold (K) are positioned in a lower part of said outlet manifold (paragraph 0004).

With regard to Claim 6, Yoshimoto et al. discloses in Figure 3, wherein said inlet manifold (6) has a constriction, a point at which the manifold curves around a cylindrical/tubular piercing member (4), between said gas supply pipe (6a) connection and said lowermost part of said gas flow channel connected. The gas flow into the

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manifold (6) is flow-regulated because a flow passage is narrowed by the piercing member (4), and because of this, gas dispersion is promoted in the manifold (6) and the gas distribution/supply of gas to each cell is unified (paragraph 0026).

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimoto et al. (US 2003/0104265 A1) and Misawa et al. (US 5,158,837), as applied to Claims 1 and 3-6 above, and in further view of Sugita et al. (US 6,723,463 B2).

Yoshimoto et al. and Misawa et al. disclose the polymer electrolyte fuel cell in paragraph 4 above, but do not disclose wherein at least one gas flow channel has a serpentine configuration which is arranged substantially parallel to gravity.

Sugita et al. discloses a fuel cell stack (1) formed with a plurality of fuel cell units (2) stacked together in a horizontal direction, each of the fuel cell units comprising a solid polymer electrolyte membrane, an anode electrode, a cathode electrode and a pair of separators (17) which hold the anode and cathode electrodes (column 1 lines 44-58). The surface (17a) of the separator (17) is provided with grooves for gas flow and communicating with gas supply port (25a) and gas exhaust port (25b). The grooves together form a serpentine shape with one and a half alternating turns in the surface of the separator (column 6 lines 21-31). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a separator having grooves or flow channels with a serpentine configuration in the fuel cell of Yoshimoto et al., because Sugita et al. teaches the gas traveling along longer passages as compared to the case in which passages are horizontally formed parallel to the long side of the separator and,

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therefore, the gas can be effectively utilized and a high power generation efficiency can be obtained (column 6 lines 47-53).

Response to Arguments

6. Applicant's arguments with respect to claims 1 and 3-6 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571)272-

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8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795

Karie O'Neill
Examiner
Art Unit 1795

KAO